

TITLE: INDEXING DISPENSER

[001] This invention relates to the technology disclosed in patent publication CA. 2,430,936, (Dec. 2004,Allen), and claims the benefit of priority of UK Patent # GB2443034, (Jan. 2011 Allen). The indexing dispenser, there disclosed performs holding, transporting, and dispensing functions, and possesses numerous benefits and advantages over known rotary indexing dispensers.

TECHNICAL FIELD

[002] The present invention aims to simplify some features, which diminishes some assembly labour requirements associated with cost, to be more user friendly, especially to users with limited fine motor ability, and amputees, one can actually reload and dispense the pills by the use of one hand only. The present invention also aims to provide a rotary indexing dispenser, which successfully integrates simple components. The new dispenser is aimed at being simple to activate, using only one hand. Preferred features include reservoir that allows several-week supply of pills to be stored, and stacked in advance, and safety features which make inadvertent operation unlikely.

BACKGROUND

[003] It is known in prior art to provide a rotary manually operated pill dispenser with trays, locks, cylindrical canister, carousel mounted on a rotary table. Some prior examples are shown in US-5,323,929 (Marlar, 1992), US-6,234,343(Papp 2001) which dispenses through an open tablet tray. US-6,068,158 (Chabout, 2000) automatic with an hopper. US-5,522,525, (McLaughlin, 1994), US-6,234,346, (Castleberry1976), snack trays resembling wedding cake.

US-4,117,952 (Grimes, 1976) automated capsule dispenser with receiving tray, US-6,062,420, (Krawl 1998), US-4,572,376 (Wrennall 1986), a pair of lids that rotates independently, US-2004/0,256,406 A1, (Allen 2003).

[004] In the prior art, designers have included a reminding device, a safe travelling device, a skipped or double dose prevention device, and so on. Unfortunately each dispenser has had some deficiency, for example: too large in size, too expensive in price, requiring too high a level of skills and coordination to access. The task to access these dispensers may also be difficult for amputees, and other users with arthritic conditions, or with limited fine motor ability.

[005] The designs as depicted herein are aimed at including the beneficial aspects of the prior art designs in a new design that is less expensive, easier and less confusing to access, and does not compromise its safety features.

BRIEF SUMMARY

[006] The invention will now be describe by way of example, with reference to the accompanying drawings, in which:

FIG.1 is a pictorial view of the underside of a lid or cover of a pill dispenser;

FIG. 2 is a pictorial view of the underside of a base component of the dispenser;

FIG. 3 is a view of the topside of the base, showing its multiple compartments;

FIG. 4 is a pictorial view of pill supply reservoir of the dispenser;

FIG. 5 is a pictorial view of a conical spring component of the dispenser;

FIG. 6 is a pictorial partly exploded view of some of the component of the dispenser;

FIG. 7a is a diagrammatic plan view showing the cover of a dispenser assembled to the base;

FIG. 7b is the same view as **FIG. 7a** but with the cover relatively rotated;

FIG. 7c is the same view as **FIG. 7a** but with the cover rotated further;

FIG. 8a is a diagrammatic side view, showing some of the cylindrical parts of the cover and base as if unrolled;

FIG. 8b is the same view as **FIG. 8a** but with the cover relatively rotated;

FIG. 8c is the same view as **FIG. 8a** but with the cover rotated further;

FIG. 9 is a sectioned side elevation of the dispenser;

FIG. 10 is the same view as **FIG. 9** of another dispenser;

FIG. 11.(which appears with **FIG. 5.**) is an exploded pictorial view of the dispenser of **FIG. 9**

DETAILED DESCRIPTION

[007] The dispenser 30 includes a cover 32, which is formed with a pill dispensing porthole 34, and also with an associated primary indexing tab A. An arrow 36 on the cover 32 identifies the primary tab A. A base 38 of the dispenser 30 is formed with twenty-eight pill containing compartments 40. To dispense pills, the user aligns the arrow 36 with the particular day and time of the dose. This results in the dispensing porthole 34 being aligned with the compartment for the day and time. To dispense the pills, the user tips the dispenser 30 upside down, whereupon the pills fall out of the aligned compartments.

[008] In the example shown, the designer has provided twenty-eight compartments, corresponding to four pill doses per day, for one week. (The designer may alternatively provide other configuration. The minimum number of compartments, for the invention to be applicable, would be seven.) The day and time of each dose is labelled on the outside of each respective compartments. The same information is provided in Braille. To replenish the compartments 40, the cover 32 is removed from the base 38 whereupon the compartments 40 now all lie exposed, and further pills can be added by the user or caregiver. The base and the cover may be moulded in a transparent plastic material for better visibility.

[009] FIG. 7a is a plan view of (part of) the base 38 and cover 32 of another pill dispenser. The base 38 is formed with a series of sockets, which are defined by projections 43 on the shelf 45 of the base. In this case, there are twenty-nine sockets, pitched in a circle centered on the axis of the rotation 50 of the cover 32. The twenty-nine sockets correspond to orientations of the cover 32, in which the porthole 34 in the cover overlies respective ones of the twenty-eight compartments 40 in the base 38, plus one remove-cover orientation, at which the cover can be removed from the base.

[0010] Some of the sockets between the projections 43 termed open-sockets, are wider than the other sockets. The six sockets at numbered locations 1,7,12,19,22,28 are the open-sockets. The sockets in the remaining numbered locations are termed the tight sockets. FIG. 7a shows the cover 32 in its remove cover orientation, and it can be seen that the designer has arranged for the six tabs A,B,C,D,E,F on the ledge 47 of the cover 32 to be aligned with the six open sockets, at this orientation of the cover. Thus, in the remove-cover orientation of the cover, the ledge 47 of the cover is now not constrained underneath the shelf 45 of the base, and the cover can now be lifted off.

[0011] FIG. 7b shows the cover 32 having been rotated counter-clockwise one twenty-ninth of a complete revolution. Now, the tab A overlies the tight-socket at location 29. It will be

noted that, in this orientation, all six of the tabs overlay respective tight-sockets, i.e. none of the tabs now overlies one of the open-sockets. The tight-sockets are circumferentially narrower than the circumferential width of the tabs, whereby the tabs cannot pass through the tight-sockets, and the cover 32 cannot be removed from the base 38.

[0012] It will be understood that, with the cover 32 shown in the orientation of FIG. 7b, the cover is firmly held in place on the base 38. All six of the tabs are constrained by the tight-sockets, whereby the ledge 47 of the cover engages the shelf 45 of the base, and the cover is securely held onto the base

[0013] FIG. 7c shows the cover 32 having been rotated further. Now the tab A overlies the open-socket at location 22. The tab B on the cover also overlies one of the open-sockets, being the one at location 28. These tabs A,B, in FIG. 7c, orientation of the cover, therefore cannot contribute anything to the security with which the cover is guided and carried for rotation with respect to the base. In FIG. 7c, all the guiding constraint for the cover must therefore come from the other four tabs C,D,E,F which do overlie respective tight-sockets, as shown.

[0014] A polygon (being a quadrilateral, 49 in this case) has been drawn, by joining up the tabs that overlie tight-sockets. Attention is drawn to the fact that the axis 50 about which the cover rotates is located inside the perimeter of this polygon. With the axis being inside the polygon, the four tabs C,D,E,F that provide constraint for the cover are well spaced around the circumference of the ledge and shelf, providing good guiding stability.

[0015] Note that if there were to be an orientation of the cover in which the axis 50 lay outside the perimeter of the polygon, it would mean that all the tabs contributing to the provision of guiding constraint for the cover would then all be on one side of the ledge and shelf. If such a configuration were allowed, therefore, the cover be liable to tipping, relative

to the base. Even if the cover did not fall off, it might encounter misalignment problems and liable to jamming.

[0016] The designer should therefore see to it that, in everyone of the possible orientations of the cover, (other than the remove cover-orientation, of course), as many as possible, and never fewer than three, of the tabs overlies tight-sockets. The designer should also choose a configuration of tabs and sockets in which, in everyone of the possible orientations of the cover that corresponds to the porthole overlying one of the compartments, also that the configuration should be such that a triangle joining those three includes the axis 50 within its perimeter.

[0017] The configuration in FIGs. 7a-7c is not the only one of which this condition is true, even for dispensers having twenty-eight compartments. The prudent designer will lay out a proposed configuration of tabs and sockets before committing to a final design of the dispenser, and will check (e.g by trial and error) that, of all the possible orientations of the cover in which the porthole overlies one of the compartments, there is none in which fewer than three tabs overlies tight-sockets. Theoretically, the functional requirements of the tabs and sockets configuration might be met with as few as three tabs (and the number of open-sockets must be at least equal to the number of tabs). The larger the number of tabs and (open-sockets), the easier it will be for the designer to hit upon a configuration in which the functional requirements are not met in respect of all possible orientations. Of course, the functional requirements would not be met at all, if only two tabs or only one tab were provided; in that, then, no polygon at all could be drawn.

[0018] Each tight-socket designed between the projections 43 is so shaped as to block a tab positioned over that socket from passing through the socket. However, as illustrated in FIGs 8a-8c, the tab and the tight-socket are so shaped with respect to each other that the tight-socket does provide a measure of rotational restraint against the respective tab. A chamfer is

provided on one (or both) of the tab and the tight-socket, whereby, when the tab is biased in the direction axially towards the tight-socket, the tab is urged circumferentially rotationally towards a central position within the tight-socket. Thus, the design of the tabs and tight-sockets serves as an indexing detent apparatus.

[0019] The cover is biased away from the compartments in the base, by a spring 52. Thus the base 47 (of which the tabs are apart) and the shelf 45 (of which the sockets are apart) are urged together, by the spring 52. Consequently, the spring 52 provides the biasing force which urges the tabs into contact with the tight-sockets. Thus, if there is no contact with the cover, the cover will remain indexed in that particular orientation dictated by the particular tabs and tight-sockets that are in alignment.

[0020] To over-ride the indexed position, the user manually rotates the cover. This causes the tabs to ride up on the chamfer, whereby the cover moves axially away from the base at the same time as rotates relative to the base. Thus, the tab on ledge 47 of the cover 32 lift itself over the projection 43 and disengages itself from the tight-socket on shelf 45 of the base 38. The tab now rest on one of the projections 43 that define the sockets. (Other tabs rest on others of the projections, as shown in FIG.8b). Also shown in FIG.8c (and FIG. 7c), one (or more) of the tabs would not engage with one of the tight-socket if that tab was positioned over one of the open-sockets. Only one tab needs to engage with the

tight socket in order to perform the indexing function; however, as mentioned, the designer will see to it that at least three of the tabs do engage with corresponding with tight-sockets, for the other reasons as described.

[0021] The user can also disengage the tabs from the sockets, enabling the cover to be rotated by pressing the cover towards the base, against the spring.